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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	
Ording, Bas	Group Art Unit: 2671
Application No.: 09/754,147	Examiner: Scott A. Wallace
Filed: January 5, 2001	Appeal No.: [Type Appeal No]
For: Time-Based, Non-Constant Translation of User Interface Objects Between States	

BRIEF FOR APPELLANT

Mail Stop APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated January 30, 2004 (Paper No. 18), thrice rejecting claims 1-5, 7, 8, 10-17 and 19-29, which are reproduced as an Appendix to this brief.

A check covering the ☐ $165.00 (2402) ☒ $330.00 (1402) Government fee was previously paid on October 22, 2003. Two extra copies of this brief are being filed herewith.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. A copy of this page and the signature page are submitted in triplicate.

I. Real Party in Interest

The present application is assigned to Apple Computer, Inc., a corporation duly organized under and pursuant to the laws of California and having its principle place of business at One Infinite Loop, Cupertino, California 95014.

II. Related Appeals and Interferences

Appellant's legal representative, or assignee, does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

The application contains 29 claims, of which claims 6, 9 and 18 were canceled, and claims 1-5, 7, 8, 10-17 and 19-29 are pending and the subject of the present appeal.

IV. Status of Amendments

Subsequent to the final Office Action mailed April 22, 2003, a Brief for Appellant was filed. In response to Appellant's brief , the finality of the April 22, 2003 action was withdrawn and a new Office Action was issued. Subsequent to the new Office Action mailed on January 30, 2004 no amendments have been filed.

V. Summary of the Invention

The claimed invention is directed to graphical user interfaces (GUIs) for computers, and more specifically the movement of GUI objects that are displayed to the user. For example, a common technique that is employed with GUIs involves "minimizing" and "maximizing" windows. The technique of minimizing and

maximizing windows involves resizing and repositioning windows. When minimizing a window, the window is reduced in size to a miniaturized representation of the larger or full-sized window, or to an icon representation. When maximizing a window, the window is enlarged from a miniaturized representation of the window, or an icon representation, to a larger or full-sized window. As one skilled in the art will readily appreciate, a user may initiate the process of maximizing or minimizing a window by selecting an on-screen button, typically associated with the window itself, or by depressing one or more keys on the keyboard. [Page 1, line 25 through page 2, line 6.]

With respect to manipulating windows (e.g., opening, closing, sizing, repositioning), conventional operating systems primarily focus on efficiency. However, operating systems do not focus on the aesthetics associated with these operations, particularly minimizing, maximizing and restoring operations. Accordingly, it would be desirable to provide more aesthetically pleasing operations, while continuing to provide all of the functionality associated with traditional techniques. [Page 2, lines 7-12.]

The invention provides more aesthically pleasing operations by carrying out the movement of user interface objects on the desktop, such as windows, icons, tiles, etc., in a time-based manner. In addition, this effect is independent of processor speed, so that a consistent look is presented regardless of the model of computer with which the user interface is used. [Page 12, lines 19-23]

According to this embodiment of the invention, a non-linear translation rate is employed, wherein the object appears to move slowly at the beginning and end of its path of movement, and faster during the middle portion of the movement. Thus, for

instance, in the example of Figures 2A-2F, as the window 200 begins its downward movement from the state of Figure 2C, it begins slowly, then appears to move faster as it passes through the state of Figure 2D, and finally slows down again as it settles into its final position 220 shown in Figure 2F. [Page 12, line 24 through page 13, line 2.]

According to a preferred embodiment, a sinusoidal function is employed to provide this effect of acceleration and deceleration during the movement of the object. Referring to Figure 8, the total length of the translation that is to take place is depicted in a range of 0 to 1, and occurs over a duration of time T. Thus, in the example of Figures 2A-2F, the total vertical translation is equal to the distance S-Q. The amount that the object moves during each increment of time in this interval, e.g. every 30 milliseconds, can be viewed relative to movement along the periphery of a semicircle in equi-angular increments. For instance, if the interval T is divided into 8 segments, each interval corresponds to an arc of 22.5°, as shown in Figure 9. When the end point of each arc is projected onto a linear axis, i.e. the diameter of the semicircle, the results indicate the amount of linear translation that takes place during each interval. As can be seen, the amount of movement that takes place during the first interval of time, $t_1 - t_0$, is significantly less than the distance traveled during the middle periods, e.g. $t_4 - t_3$ and $t_5 - t_4$. Similarly, the amount of movement in the later periods are also less than during the middle periods. As a result, the object appears to first accelerate and then decelerate over the total range of its motion. The semicircle, therefore, represents a non-constant velocity function over the path of movement along the axis. [Page 13, lines 3-18.]

To determine the instantaneous position of the object during movement in accordance with the foregoing approach, the following values are defined for movement in a direction of interest, e.g. along the x axis:

x_{start} -starting position of a reference point on the object (e.g. the upper left corner Q of the window illustrated in Figure 2A)

x_{end} - final position of the reference point on the object (e.g. the point S')

t_{start} - starting time for the translation

T - total duration for the translation

Once these values have been defined, the elapsed time is calculated as:

$$t_{elapsed} = t_{now} - t_{start} \tag{1}$$

where t_{now} is the current time. Using this value, a distance factor F is computed as follows:

$$F = 0.5 - [0.5 \cos (\pi * t_{elapsed}/T)] \tag{2}$$

This calculation results in a value in the range of 0 to 1, i.e. a point along the linear axis. This value is then used to determine the instantaneous position of the object, as follows:

$$x_{now} = x_{start} + (x_{end} - x_{start}) *F \tag{3}$$

The procedure of Equations 1-3 is repeated during the period of time T, until the object has reached the final position. [Page 13, line 19 through page 14, line 6.]

A particular advantage of this technique for translating objects is the fact that it is based on time, and is independent of the processor speed of the computer on which the operating system is being run. Hence, a consistent appearance will be associated with the user interface across all models of computers, rather than

appearing relatively sluggish on older, slower computers or too fast to be perceived on newer, faster computers. [Page 14, line 10-14.]

While the preceding example has been particularly described with reference to the movement of a window, it will be appreciated that it is not limited to such. Rather, the non-linear translation can be applied to any object which is automatically moved in a user interface. For instance, if a user removes one of the tiles 260 in the userbar 270, or maximizes it into an open window, the other tiles can move horizontally to fill the gap created by the removed tile. Likewise, if a new tile is inserted in the userbar, or the relative positions of the tiles are changed, the existing tiles can move away from the tile being inserted to provide space for it to be accommodated. The movement of each tile can be controlled in accordance with the foregoing technique, to create a pleasing effect. Similarly, the dropping down of menus and any other type of movement animation that is automatically performed in a user interface can employ this effect. [Page 14, lines 15-25.]

Although a sinusoidal function has been identified since it produces a particularly interesting effect, any other function representing a velocity which increases and/or decreases over time, particularly a non-linear function, can be employed to produce a desired effect during the movement of the object. [Page 14, lines 26-29.]

VI. The Issues

A. Whether claims 1-5, 7, 8, 10, 14-17, 19, 20, 21, 25 and 26 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over the Chang et al. article, "Animation From Cartoons to the User Interface", 1993, ACM 0-89791-628-X/93/0011 ("Chang") in view of U.S. Patent No. 6,414,684 to Mochizuki et al. ("Mochizuki").

B. Whether claims 11, 22 and 27 were properly rejected under 35 U.S.C. §103(a) as being unpatentable over Chang in view of Mochizuki, further in view of the IBM TDB article, "Window Closing Animations", IBM Technical Disclosure Bulletin, US, IBM Corp, NY, 1 Nov 1995, ISSN 0018-8689 ("IBM article").

C. Whether claims 12, 13, 23, 24, 28 and 29 were properly rejected under 35 U.S.C. §103(a) as being unpatentable over Chang in view of Mochizuki, further in view of U.S. Patent No. 5,796,402 to Ellison-Taylor ("Ellison-Taylor").

VII. Grouping of Claims

For purposes of this appeal: Claims 1, 2, 14, 15 and 20 stand or fall together; Claim 4 stands alone; Claims 3, 7, 10, 16, 19, 21 and 26 stand or fall together; Claims 5, 8, 17 and 25 stand or fall together; Claims 11, 22 and 27 stand or fall together; and Claims 12, 13, 23, 24, 28 and 29 stand or fall together. The reasons the claims are grouped as above are explained below in the "Argument" sections.

VIII. Argument

A. Claims 1-5, 7, 8, 10, 14-17, 19, 20, 21, 25 and 26 Are Not Properly Rejected Under 35 U.S.C. § 103(a) As Being Obvious over Chang in view of Mochizuki.

It is well known that in order to support a rejection under 35 U.S.C. §103, the Examiner must establish a *prima* facie case of obviousness. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must some motivation to combine the applied references. Second, there must be a reasonable expectation of success. Finally, the combination must teach each and every claimed element. In the present case, the rejection of claims 1-5, 7, 8, 10, 14-17, 19, 20, 21, 25 and 26 is improper because the Examiner fails to establish a *prima facie* case of obviousness.

1. The Examiner fails to provide proper motivation to combine Chang and Mochizuki.

In rejecting claim 1, the Examiner asserts that although Chang "does not specifically teach calculating an instantaneous position for the object along said path in accordance with said function and the relationship of a current time value to said period of time", this is disclosed in Mochizuki in the abstract and Fig. 15b. Therefore, according to the Examiner, it would have been obvious to one skilled in the art to "use the current time value with the period of time to calculate the instantaneous position because it is well known that finding the position of an object moving during a particular time that at any instant of time position can be found."

Accordingly, the Examiner appears to be asserting that it would have been obvious to modify the teachings of Chang to include calculating the instantaneous

position because means for doing so are well known. However, the mere fact that individual elements or features of the claimed invention are known is not in and of itself sufficient to render the resultant combination obvious, absent some objective reason to combine the teaching.

As stated in the MPEP §2143.01:

> A statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood,* 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). Emphasis in the original.

Nowhere has the Examiner provided any objective reason to combine the teachings of Chang and Mochizuki. To the contrary, the Examiner merely states that it would have been obvious to modify Chang in order to include well known instantaneous position calculations as allegedly taught by Mochizuki. Accordingly, absent proper motivation to combine the teachings of Chang and Mochizuki, the rejection of claims 1-5, 7, 8, 10, 14-17, 19, 20, 21, 25 and 26 in view of the combination of Chang and Mochizuki is improper.

2. The combination of Chang and Mochizuki fails to disclose each and every claimed element.

Chang discloses a user interface that employs cartoon animation principles in rendering/displaying interface objects. For example, to give a feeling of weight to objects and physicality to their movement, Chang employs a technique referred to as slow-in and slow-out rather than drawing objects *equally spaced* in space and time.

As a result of this process, objects appear to move out of a position slowly, then quickly during the bulk of the movement, and then slowly into the ending position. (See page 50 and FIG. 8 of Chang). Chang applies this slow-in, slow-out animation technique to all movement within the user interface, for example, boxes and menus growing or shrinking, arrows growing or shrinking, and boxes entering and exiting offscreen. Chang is silent, however, as to how this slow-in, slow-out animation process is achieved in the user interface.

Mochizuki discloses a method for communicating computer graphics animation data between computers wherein the animation data includes a case where motion of an multi-joint object or an elastic object is described as time series data. The method of Mochizuki comprises four stages. In the first stage, animation data, comprising configuration data of an object, the environment where it exists, attribute data, light source data, camera parameters, shading methods, time series motion data, and the like are formed and/or edited and stored within the server. In the second and third stages, the stored animation data is transmitted to and stored within a client computer in response to a request for the data. Finally, the animation data is rendered in the client computer.

The present invention relates to graphical user interfaces, and more particularly to the movement of user-interface objects, such as icons and windows. The present invention provides an aesthetically pleasing visual effect when repositioning, resizing, or generally manipulating a displayed object, such as a window. For example, according to exemplary embodiments, when a window moves from a first position to a second position, the rate of translation is controlled in a non-linear manner (e.g., in accordance with a sinusoidal function) to provide the visually

pleasing effect. In one embodiment, the object accelerates and then decelerates as it moves. The rate of acceleration and deceleration is *time-based*, so that the same type of effect is achieved on all computers, independent of their respective processor speeds. The invention as recited in claims 1-5, 7, 8, 10, 14-17, 19, 20, 21, 25 and 26 is patentably distinguishable over the combination of Chang and Mochizuki for at least the reason that the combination fails to disclose or suggest each and every claimed element as discussed below.

Independent claim 1 defines a method for moving an object in a graphical user interface. The method includes, *inter alia*, the steps of: determining a path of movement for the object along at least one axis, and a period of time for the movement along said path; establishing a non-constant velocity function along said axis for said period of time; calculating an instantaneous position for the object along said path in accordance with said function and the relationship of a current time value to said period of time; and displaying said object at said calculated position. Independent claim 14 defines a computer-readable medium containing a program which executes steps substantially similar to the steps of method claim 1. Claims 2 and 15 depend from independent claims 1 and 14. For purposes of this appeal, claims 1, 2, 14 and 15 stand or fall together.

In rejecting claim 1, the Examiner asserts that the combination of Chang and Mochizuki discloses the steps of determining a path of movement for the object along at least one axis and *a period of time for the movement along said path*; and establishing a *non-constant velocity function* along at least one axis for a period of time inasmuch as Chang discloses applying a slow-in, slow-out animation technique to a user interface. To support this position, the Examiner points to FIGs. 8 and 9

and the discussion of the slow-in and slow-out concept on page 51 of Chang. This assertion is unfounded for the following reasons.

Although Chang may disclose displaying an object at various positions between a starting position and an ending position wherein the distances between the positions are closer at the beginning and end than during the middle of the transition (illustrated in FIGs. 8 and 9), Chang fails to disclose that this slow-in, slow-out process is achieved by the claimed steps of: determining a period of time, establishing a non-constant velocity function for said period of time, and calculating an instantaneous position for the object along said path in accordance with the non-constant velocity function and the relationship of a current time value to the determined period of time. The passage cited by the Examiner (i.e., page 51 of Chang) does not disclose *how* the slow-in, slow-out effect is achieved.

Since Chang fails to explicitly disclose the steps of determining a period of time for the movement of the object along the path; and establishing a non-constant velocity function along an axis for a period of time as claimed, it appears that the Examiner is asserting that these steps are inherent to the disclosure of Chang inasmuch as Chang appears to achieve a similar result (i.e., the appearance of a change in the speed of an object's movement).

Regarding the inherency of claimed limitations, section 2112 of the MPEP states: "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic" (emphasis in original). Furthermore, Ex parte Levy states:

> In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of

the applied prior art. Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)

However, in the present case, the Examiner fails to provide any basis in fact or technical reasoning to support the determination that the slow-in, slow-out process disclosed in Chang is achieved by determining a period of time for the movement of the object along the path, and establishing a non-constant velocity function as claimed. To the contrary the Examiner merely points to various figures in Chang, which show various animation results, as disclosing specific steps for achieving the shown results. For example, the Examiner states that the discussion of the slow-in slow-out technique disclosed on page 51 of Chang illustrates an object that moves slow in the beginning and end and faster in the middle. However, this is not what page 51 of Chang is disclosing. Rather, Chang discloses the visual effect of varying the distance between rendered (i.e., displayed) objects to a user. More specifically, the object appears to move at a varying speed. This is not the same as disclosing that a non-constant velocity function along an axis for a specific period of time is determined as claimed.

Finally, the claimed steps are not inherent to the disclosure of Chang for at least the reason that the claimed steps do not necessarily flow from the slow in, slow-out process of Chang. For example, regarding the claimed step of establishing a path of movement for the object along at least one axis and a period of time for the movement, Chang discloses that the slow-in, slow-out process is applied to *all* object movements, including stationary objects which change only in size, for example arrows or menus growing or shrinking (see column 1 page 51 of Chang). Accordingly, the slow-in, slow-out process of Chang is applied in situations where

the object is stationary and therefore would not include the step of establishing a path as asserted by the Examiner.

Furthermore, the results of Chang may be achieved by various techniques or calculations based on speed alone, or distance alone. For example, the number of and distance between each displayed object may be based on the total distance to be traveled. Therefore, the non-constant velocity function of the present invention does not *necessarily* flow from the teachings of Chang.

Although Mochizuki discloses formulating and storing graphic animations in the form of time series of motion, Mochizuki fails to disclose the steps of determining a path of movement for the object along at least one axis, and a period of time for the movement along said path; and establishing a non-constant velocity function along said axis for said period of time. Therefore, Mochizuki can not be interpreted as disclosing calculating an instantaneous position for the object along said path in *accordance* with said *function* inasmuch as Mochizuki fails to disclose determining said path or said function. Accordingly, Mochizuki fails to overcome the deficiencies of Chang.

Since Chang and Mochizuki both fail to disclose or suggest the same steps, the combination of these two references cannot possibly disclose or suggest said steps. Therefore, even if one skilled in the art were motivated to combine Chang and Mochizuki, the combination would still fail to render claims 1, 2, 14, and 15 unpatentable.

Independent claim 5 defines a method of moving an object in a graphical user interface that includes, *inter alia*, displaying the object at sequential positions along a path from a starting location to a final location at increments of time, such that the

distance between successive positions varies in accordance with a *non-linear function* so that the object appears to be moving at a changing velocity. Independent claim 8 defines a user interface comprising means for carrying out the steps of claim 5. Furthermore, independent claims 17 and 25 define a computer-readable medium containing a program and a user interface, respectively, which executes/implements steps substantially similar to the steps of method claim 5. Accordingly, claims 5, 8, 17 and 25 stand or fall together.

In rejecting claims 5 and 8, the Examiner asserts that Chang discloses a method for moving an object in a graphical user interface that includes the steps of identifying a starting location, selecting a final location, and displaying the object at sequential positions along a path from the starting location to the final location at increments of time such that the object appears to be moving at a changing velocity. However, the Examiner fails to address the claimed element of the distance between successive positions varying in accordance with a non-linear function.

The traditional animation techniques that Chang applies to the user interface were traditionally achieved through the creation of multiple animation cells, i.e., individual displays that were sequentially projected at a particular frame rate. As a result, the animation techniques discussed in Chang were achieved based on the amount of change between the individual animation cells. For example, the slow-in, slow-out process discussed in Chang would have been achieved by varying the *distance* in the object's position in each successive cell, not based on a non-linear function. Furthermore, nowhere in Mochizuki is there any disclosure or suggestion the time series animation data includes varying the distance between successive

positions in accordance with a non-linear function. Accordingly, the combination of Chang and Mochizuki fails to render claims 5 and 8 unpatentable for at least the reason that the combination fails to disclose each and every claimed element.

Dependent claims 3, 7, 10, 16, 19, 21 and 26 recite, in addition to the limitations of their respective base claims, that the velocity function is a *sinusoidal function*. Accordingly, claims 3, 7, 10, 16, 19, 21 and 26 stand or fall together.

In rejecting claims 3, 7, 10, 16, 19, 21 and 26, the Examiner asserts that Chang *implicitly* teaches that the function is a sinusoidal function since Chang teaches the velocity of the object increases gradually to a maximum value in the slow-in phase, and then decreases gradually, similar to a sine function. This assertion is unfounded for the following reason.

First, as discussed above Chang fails to disclose or suggest determining a function, much less a sine function. Furthermore, even if one where to interpret the varying distances of Chang as varying velocity, nowhere in Chang is there any disclosure that the distance/velocity varies in accordance with a sine function. The alleged disclosure in Chang of increasing the velocity to a maximum and then decreasing of the velocity could be achieved in accordance with any number of functions. For example, assuming, *arguendo*, that the system of Chang employed a velocity function, the velocity function could be a step function and still achieve the slow-in, fast middle, slow-out effect. Accordingly, varying the velocity in accordance with a sine function does not necessarily flow from the disclosure of increasing the velocity to a maximum and then decreasing it as allegedly disclosed in Chang.

Although Mochizuki discloses formulating and storing graphic animations in the form of time series of motion, Mochizuki fails to disclose establishing a non-linear

velocity function, much less that the function is a sine function. Therefore, since Chang and Mochizuki both fail to disclose or suggest the same claimed elements, the combination of these two references cannot possibly disclose or suggest said elements. Therefore, even if one skilled in the art were motivated to combine Chang and Mochizuki, the combination would still fail to render claims 3, 7, 10, 16, 19, 21 and 26 unpatentable.

Claim 4 recites, in addition to the limitations of claim 1 from which it depends, that a ratio of the elapsed time to the total time duration is calculated and applied to the velocity function to determine a translation factor. Accordingly, claim 4 stands alone.

In rejecting claim 4, the Examiner asserts that the claimed steps are "known as taught by Chang, since Chang displays translation from initial position to current position based on time, distance and velocity." This assertion is unfounded for the following reasons.

Again, the Examiner fails to provide any basis in fact or technical reasoning to support the conclusion that the claimed steps of calculating a ratio, applying it to a velocity function, and determining a translation factor *necessarily* flow from the disclosure of Chang. Furthermore, nowhere in Chang any is there any disclosure or suggestion of the translation from initial position to current position based on "time, distance and velocity" as asserted by the Examiner. To the contrary, cartoon animation techniques (which Chang applies to graphical interfaces) were historically created two-dimensionally using hand drawn frames, not velocity calculations and translations factors as claimed.

Furthermore, nowhere in Mochizuki is there any disclosure or suggestion of calculating a ratio of the elapsed time to the total time duration and applying it to the velocity function to determine a translation factor as claimed. Since Chang and Mochizuki both fail to disclose or suggest the same claimed element, the combination of these two references cannot possibly disclose or suggest said element. Therefore, even if one skilled in the art were motivated to combine Chang and Mochizuki, the combination would still fail to render claim 4 unpatentable.

Independent claim 20 recites a user interface that includes, *inter alia*, means responsive to a user action for selecting a location to which said object is to be moved and a period of time during which the movement is to occur, and for moving the object from a first location to the second location at a non-linear rate of movement during said period of time.

In rejecting claim 20, the Examiner asserts that claim 20 is a user interface claim for a combination of claims 1 and 2, and therefore is rejected with the same rationale as claims 1 and 2. However, claims 1 and 2 are patentably distinguishable over the combination of Chang and Mochizuki for at least those reasons presented above. Furthermore, nowhere in the combination is there any disclosure of selecting a period of time within which is the object is to be moved, much less that the rate of movement during said period of time is non-linear. (See discussions above.)

B. Claims 11, 22 and 27 Are Not Properly Rejected Under 35 U.S.C. § 103(a) As Being Obvious Over Chang in View Mochizuki, Further In View of The IBM Article.

The IBM article discloses that various animated effects, such as shattering like a pane of glass, or melting as if exposed to intense heat, can be employed in a

user interface to provide feedback to a user after initiating an operation to close a window. However, the IBM article fails to overcome the deficiencies of Chang and Mochizuki discussed above with regard to independent claims 8, 20 and 25, from which claims 11, 22 and 27 depend respectively. More specifically, the IBM article fails to disclose or suggest a user interface that includes means for displaying the object at different sequential positions during respective increments of time, such that the distance between successive positions varies in accordance with a *non-linear function* as recited in claim 11, or means for *selecting a period of time* for moving the object and for moving the object at a *non-linear rate of movement* during the period of time as recited in claims 22 and 27.

In rejecting claims 11, 22 and 27, the Examiner asserts that since the IBM article teaches animations for minimizing a window, it would have been obvious to one skilled in the art "to incorporate the animation for minimizing the window in the invention of Chang and Mochizuki, in order to provide effective feedback on user action." However, the Examiner fails to address how the window closing feedback animations of the IBM article overcome the deficiencies of Chang and Mochizuki.

Since Chang, Mochizuki and the IBM article each fail to disclose or suggest a user interface that includes means for displaying the object at different sequential positions during respective increments of time, such that the distance between successive positions varies in accordance with a non-linear function as recited in claim 11, or means for selecting a period of time for moving the object and for moving the object at a non-linear rate of movement during the period of time as recited in claims 22 and 27, the combination of these three documents cannot possibly disclose or suggest said features. Therefore, even if one skilled in the art

were motivated to combine Chang, Mochizuki, and the IBM article, as suggested by the Examiner, the combination would still fail to render claims 11, 22 and 27 unpatentable for at least the reason that combination fails to disclose each and every claimed element.

C. Claims 12, 13, 23, 24, 28 and 29 Are Not Properly Rejected Under 35 U.S.C. § 103(a) As Being Obvious Over Chang in view of Mochizuki, further in View of Ellison-Taylor.

Claims 12, 13, 23, 24, 28 and 29 recite, in addition to the features of their respective base claims, that when the user action results in the removal/insertion of one object from/into a series of objects, means responsive to the user action causes other objects in the series to move toward/away from the deleted/inserted object.

Ellison-Taylor discloses a method of automatically aligning windows on a computer screen. However, Ellison-Taylor fails to overcome the deficiencies of Chang and Mochizuki discussed above with respect to claims 8, 20 and 25, from which claims 12, 13, 23, 24, 28 and 29 variously depend.

In rejecting claims 12, 13, 23, 24, 28 and 29, the Examiner asserts that because Ellison-Taylor discloses a tiling program that aligns windows based on the relative position and size of the window when a request is made, Ellison-Taylor implicitly discloses moving objects in a series toward the space occupied by the removed object when an object is removed, and away from the inserted object when an object is inserted. Therefore, according to the Examiner it would have been obvious to one skilled in the art "to incorporate the tiling of Ellison-Taylor in the invention of Chang, so that the object may be displayed in their final positions without overlap, so that all the objects in the display area are visible to the user

concurrently." However, the Examiner fails to provide any basis in fact or technical reasoning to support the determination that the tiling program of Ellison-Taylor moves objects in a series toward the space occupied by the removed object when an object is removed, and away from the inserted object when an object is inserted.

The tiling program disclosed by Ellison-Taylor repositions and arranges the currently displayed windows of a user-interface. Nowhere in Ellison-Taylor is there any discussion of the tiling program being initiated upon the removal or addition of a window. Accordingly, the concept of moving objects in a series toward the space occupied by the *removed object* when an object is removed, and away from the *inserted object* when an object is inserted, does not necessarily flow out of the disclosure of Ellison-Taylor.

Furthermore, since Chang, Mochizuki and Ellison-Taylor each fail to disclose or suggest a user interface that includes means for displaying the object at different sequential positions during respective increments of time, such that the distance between successive positions varies in accordance with a non-linear function as recited in claim 8, or means for selecting a period of time for moving the object and for moving the object at a non-linear rate of movement during the period of time as recited in claims 20 and 25, the combination of these three documents cannot possibly disclose or suggest said features. Therefore, even if one skilled in the art were motivated to combine Chang, Mochizuki and Ellison-Taylor as suggested by the Examiner, the combination would still fail to render claims 8, 20 and 25, from which claims 12, 13, 23, 24, 28 and 29 depend, unpatentable.

IX. Conclusion

In view of the foregoing, it is respectfully requested that the rejection of claims 1-5, 7, 8, 10-17 and 19-29 be reversed.

Respectfully submitted,

Burns, Doane, Swecker & Mathis, L.L.P.

Date April 9, 2004

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APPENDIX A

The Appealed Claims

1. A method for moving an object in a graphical user interface, comprising the steps of:

a) determining a path of movement for the object along at least one axis, and a period of time for the movement along said path;

b) establishing a non-constant velocity function along said axis for said period of time;

c) calculating an instantaneous position for the object along said path in accordance with said function and the relationship of a current time value to said period of time;

d) displaying said object at said calculated position; and

e) iteratively repeating steps (c) and (d) during said period of time.

2. The method of claim 1 wherein said function is a non-linear function.

3. The method of claim 2 wherein said function is a sinusoidal function.

4. The method of claim 1 wherein said calculating step comprises the steps of:

determining the amount of time that has elapsed since the beginning of said period of time;

calculating the ratio of said elapsed amount of time to the total duration of said period of time;

applying said ratio to said function to determine a translation factor; and

using said translation factor to determine the instantaneous position of the object along said path.

5. A method for moving an object in a graphical user interface, comprising the steps of:

identifying a starting location for the object;

selecting a final location for the object;

displaying said object at sequential positions along a path from said starting location to said final location at increments of time, such that the distance between successive positions varies in accordance with a non-linear function so that the object appears to be moving at a changing velocity.

7. The method of claim 5 wherein said function is a sinusoidal function, so that the object appears to accelerate and then decelerate along said path.

8. A user interface for a computer, comprising:

a display space within which objects are displayed; and

means responsive to a user action for moving an object displayed in said space from a first location to a second location by displaying the object at different sequential positions during respective increments of time, such that the distance

between successive positions varies in accordance with a non-linear function so that the object appears to be moving at a changing velocity.

10. The user interface of claim 8 wherein said function is a sinusoidal function, so that the object appears to accelerate and then decelerate along a path from said first location to said second location.

11. The user interface of claim 8 wherein said user action is a command to minimize a window.

12. The user interface of claim 8 wherein said user action results in the removal of one object from a series of objects, and said means causes other objects in said series to move toward the space occupied by the removed object.

13. The user interface of claim 8 wherein said user action results in the insertion of an object into a series of objects, and said means causes other objects in said series to move away from the inserted object.

14. A computer-readable medium containing a program which executes the following steps:

a) displaying at least one object in a display space;

b) determining a path of movement for the object along at least one axis within the display space, and a period of time for the movement along said path;

c) establishing a non-constant velocity function along said axis for said period of time;

d) calculating an instantaneous position for the object along said path in accordance with said function and the relationship of a current time value to said period of time;

d) displaying said object at said calculated position; and

f) iteratively repeating steps (d) and (e) during said period of time.

15. The method of claim 14 wherein said function is a non-linear function.

16. The method of claim 15 wherein said function is a sinusoidal function.

17. A computer-readable medium containing a program which executes the following steps:

displaying at least one object at a first location in a display space;

selecting a second location for the object within said display space, and a period of time within which the object is to move from the first location to the second location;

displaying said object at sequential positions along a path from said first location to said second location at increments of time within said period, such that the distance between successive positions varies in accordance with a non-linear function so that the object appears to be moving at a changing velocity along said path.

19. The method of claim 17 wherein said function is a sinusoidal function, so that the object appears to accelerate and then decelerate along said path.

20. A user interface for a computer, comprising:

a display space within which an object is displayed at a first location; and

means responsive to a user action for selecting a second location to which said object is to be moved and a period of time during which the movement is to occur, and for moving said object from said first location to said second location at a non-linear rate of movement during said period of time.

21. The user interface of claim 20 wherein said non-linear rate is a sinusoidal function, so that the object appears to accelerate and then decelerate along a path from said first location to said second location.

22. The user interface of claim 20 wherein said user action is a command to minimize a window.

23. The user interface of claim 20 wherein said user action results in the removal of one object from a series of objects, and said means causes other objects in said series to move toward the space occupied by the removed object at said non-linear rate.

24. The user interface of claim 20 wherein said user action results in the insertion of an object into a series of objects, and said means causes other objects in said series to move away from the inserted object at said non-linear rate.

25. A computer having an operating system that includes a user interface which implements the following steps:

displaying an object at a first location within a display space;

selecting a second location to which said object is to be moved and a period of time during which the movement is to occur in response to a user action; and

moving said object from said first location to said second location at a non-linear rate of movement during said period of time.

26. The computer of claim 25 wherein said non-linear rate is a sinusoidal function, so that the object appears to accelerate and then decelerate along a path from said first location to said second location.

27. The computer of claim 25 wherein said user action is a command to minimize a window.

28. The computer of claim 25 wherein said user action results in the removal of one object from a series of objects, and said means causes other objects in said series to move toward the space occupied by the removed object at said non-linear rate.

29. The computer of claim 25 wherein said user action results in the insertion of an object into a series of objects, and said means causes other objects in said series to move away from the inserted object at said non-linear rate.